

REMARKS

An excess claim fee is attached hereto to cover the cost of the claims added by this Amendment.

Claims 1-6, 8-12, 14-18 and 20-23 are all the claims presently pending in the application. Claims 7, 13 and 19 have been canceled, claims 2 and 8 have been amended to more clearly define the invention and claims 21-23 have been added. Claims 1-2, 8, 14 and 21-23 are independent.

Applicant gratefully acknowledges that claims 7, 13 and 19 would be allowable if rewritten in independent form. This Amendment adds new claims 21-23 which are directed to the features recited in claims 7, 13 and 19 respectively. Therefore, claims 21-23 are allowable. However, Applicant also respectfully submits that all of the claims are allowable.

Attached hereto is a marked-up version of the changes made to the claims by the current Amendment. The attached page is captioned "**Version with markings to show changes made.**" These amendments are made only to more particularly point out the invention for the Examiner and not for narrowing the scope of the claims or for any reason related to a statutory requirement for patentability.

Applicant also notes that, notwithstanding any claim amendments herein or later during prosecution, Applicant's intent is to encompass equivalents of all claim elements.

Claim 1 stands rejected under 35 U.S.C. § 102(b) as being anticipated by Funabashi (U.S. Patent No. 6,259,113). Claims 2-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Tsai (U.S. Patent No. 5,677,777) in view of Arai et al. (U.S. Patent No. 6,335,982).

These rejections are respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

One exemplary embodiment of the claimed invention is directed to an image scanner including a conveyor, a first light, a second light, an image information reader and a light source switching controller. The conveyor conveys a manuscript including image information to be read at a predetermined (i.e. stationary) reading position of a conveying route. The first light is located on one side of the conveying route and the second light is located on the other side of the conveying route. The image information reader reads the image information in the manuscript at the predetermined predetermined (i.e. stationary) reading position. The light source switching controller controls switching between the first and second light sources to read the image information in the manuscript. The light source switching controller renders the first light on when the image information is defined by transmitting light through the manuscript and renders the second light on when the image information is defined by light reflected from the manuscript.

Another exemplary embodiment of the present invention may include a manuscript judging device which determines whether the manuscript is the type which may be read by transmitting light through the manuscript or whether the manuscript is the type which may be read by reflecting light off the manuscript.

As shown in Fig. 1, conventional image scanners will hold a manuscript 75 stationary while the image on the manuscript 75 is read by scanning a sensor 78 in a scanning direction 77. Such scanners require elaborate mechanisms and a large amount of space to move the scanner 78 in this manner. Thus, not only do these scanners require elaborate and expensive mechanisms to

move the scanner, but they also require a large amount of space to reserve an adequate amount of space for the sensor 78 to pass through while scanning. This problem is especially problematic when space must be reserved on both sides of the manuscript to allow reflection type scanning using a first lamp 79 on a first side and also to allow transmission type scanning using a second lamp 84 on a second side of the manuscript.

Another problem with these conventional image scanners is that they also require a user to determine whether the image on the manuscript is capable of being read by transmission or through reflection of light. Thus, a user is required to make this determination.

By contrast, as shown for example in Fig. 3, the present invention maintains a predetermined (i.e. stationary) reading position (between first and second glass plates, 112 and 121) while causing the manuscript 111 to be conveyed past the predetermined (i.e. stationary) reading position in order to scan the image on the manuscript 111. As a result, the present invention may be provided with a compact and elegantly simple design. The compact design of the present invention is also able to provide for both reflection and transmission type scanning.

Additionally, the manuscript judging device is capable of determining whether the image on the manuscript is capable of being read by transmission or reflection of light without requiring input from a user (i.e. through the use of a selection switch either in software or hardware). Rather, the manuscript judging device is capable of making this determination. The result of this determination may then be used to configure the image scanner by, for example, turning on the appropriate light.

II. THE PRIOR ART REJECTIONS

A. The Funabashi reference

Regarding the rejection of claim 1, the Examiner alleges that the Funabashi reference teaches the claimed invention. Applicant submits, however, that there are elements of the claimed invention which are neither taught nor suggested by this reference.

As will be explained in detail below, the Funabashi reference does not teach or suggest the features of independent claim 1 including a predetermined (i.e. stationary) reading position.

The Funabashi reference discloses a process for erasing a residual radiation image from a stimuable phosphor sheet in which an image was recorded by radiation. The image is only readable by applying stimulating rays and then collecting the stimulated emissions produced from the phosphor sheet. (Abstract). Therefore, not only does the Funabashi reference not disclose an image scanner capable of reading an image, the Funabashi reference only discloses a means of erasing that image.

In other words, contrary to the Examiner's allegations, the Funabashi reference does not teach or suggest a light source which emits light onto a predetermined stationary reading position. Rather, the erasing light sources 2a and 2b are merely provided to erase any image existing in the phosphor sheet (col. 4, lines 13 - 50). Thus, clearly these erasing light sources 2a and 2b operate to erase any image and, therefore, could not be used to emit light onto a reading position to enable the image to be read. To the contrary, these erasing light sources 2a and 2b destroy the image.

Indeed, the Funabashi reference discloses that the erasing apparatus is to be used after the image is read by a separate reading system (col. 4, lines 51-52). These reading systems cannot use the erasing light sources 2a and 2b because those light sources erase the image. Rather, the Funabashi reference teaches that a reading system for the phosphor sheet relies upon exposing the

phosphor sheet to stimulating rays to release the radiation energy stored in the phosphor as light emission (col. 1, lines 11-27). The phosphor sheet may then be subjected to an erasing procedure in accordance with the invention described in the Funabashi reference (col. 1, lines 27-32). The Funabashi reference merely seeks to improve the process of erasing the phosphor image (col. 2, line 61 - col. 3, line 20).

While the Funabashi reference appears to disclose reading and erasing an image at the same time (col. 6, lines 35-40), it is clear that the areas in which reading and erasing occur are completely separate. While the signals which have “been read from a part of the phosphor sheet are immediately erased”, this erasing takes place while “other signals recorded in the next area of the same sheet are sequentially being read.” (col. 6, lines 37-40, emphasis added).

Additionally, the Funabashi reference also does not teach or suggest a light source switching controller based upon whether the image is readable by transmitting light through the manuscript or by reflecting light from the manuscript. Rather, the Funabashi reference discloses a completely different method of reading an image. As explained above, the Funabashi reference discloses exposing the phosphor sheet to stimulating rays and then reading the light being emitted from the phosphor sheet. The Funabashi reference does not teach or suggest reflecting or transmitting light for the purpose of reading an image. Therefore, the Funabashi reference does not teach or suggest switching lights based upon whether the image is readable by transmitting light through the manuscript or by reflecting light from the manuscript.

Lastly, Applicant will be submitting a certified copy of the priority document as well as a verified translation of the priority document to perfect the claim for priority to the filing date of January 25, 1999. The effective filing date of January 25, 1999 precedes both the publication date

of the Funabashi reference of July 10, 2001 and the filing date of the Funabashi reference of June 8, 1999. Thus, the Funabashi reference will be removed as an effective reference.

Applicant respectfully requests withdrawal of the rejection of claim 1.

B. The Tsai reference in view of the Arai et al. reference

Regarding the rejection of claims 2-20, the Examiner alleges that Sawada would have been combined with Kashiwazaki et al. to form the claimed invention. Applicant submits, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

Applicant submits that these references would not have been combined as alleged by the Examiner. Indeed, the references are directed to completely different matters and problems.

Specifically, the Tsai reference is directed to a document scanner. In particular, the Tsai reference is directed to providing a scanner which can be adapted to the location of a floppy diskette driver of a computer (col. 1, lines 48-50 and 65-67).

In contrast, the Arai et al. reference is specifically directed to an apparatus for inspecting a streak on a sheet product. In particular, the Arai et al. reference is directed to an inspection apparatus for use in a production plant to detect defects and which is especially capable of detecting defects which happen to be streaks (col. 1, line 9 - col. 2, line 23). One of ordinary skill in the art of document scanning who was concerned with adapting a document scanner to the location of a floppy diskette driver of a computer as disclosed by the Tsai reference would not have been motivated to modify such a document scanner based upon a sheet product inspection apparatus which is specifically concerned with detecting sheet defects on a sheet product

production line as disclosed by the Arai et al. reference. Thus, the references would not have been combined, absent hindsight.

Further, Applicant submits that the Examiner can point to no motivation or suggestion in the references to urge the combination as alleged by the Examiner. Indeed, the Examiner does not even support the combination by identifying a reason for combining the references.

To the contrary, the Examiner alleges that one of ordinary skill in the art would have been motivated to modify the floppy diskette document scanner disclosed in the Tsai reference with the sensor 7 used in the sheet product production line streak defect detector disclosed by the Arai et al. reference to detect when a head of a manuscript arrives at a position for scanning. However, the sensor 7 disclosed by the Arai et al. reference does not detect when a head of a manuscript arrives at a position for scanning and neither of these reference disclose performing such a function. Rather, the Arai et al. reference discloses using the sensor 7 to determine the mere presence of a sheet product (col. 4, lines 16-20).

Moreover, neither of these references teach or suggest the features of independent claims 2, 8 and 14 including an image scanner for a manuscript that conveys the manuscript past a stationary reading position (claims 2 and 8); and a manuscript type judging means which judges whether the manuscript is the type which may be read by light transmission or reflection (claim 14).

To the contrary, the Tsai reference discloses a scanner which positions a transparent document tray 203 within the housing 201. Specifically, the document tray 203 extends out of the housing in response to a user operating a controller, receives a document to be scanned and then retreats back into the housing (col. 3, lines 16-21). The scanner disclosed by the Tsai reference

then moves a double-function carriage 202 which contains light sources 2021 and 2022 and mirror 207 with which the scanner scans the document (col. 3, lines 22-32). In other words, the document tray 203 containing the document remains stationary while the reading position is “driven along the surface of the sheet.” (col. 3, lines 25-26). Thus, in the same manner as described with respect to the conventional devices in the background of the present specification, the Tsai reference teaches maintaining the document stationary while the lights and mirrors are moved. Therefore, the Tsai reference does not teach or suggest a stationary reading position as recited by claims 2 and 8.

Thus, contrary to the Examiner’s allegations, the Tsai reference does not teach or suggest moving a manuscript using the conveying roll driving means 315. As explained above, the conveying mechanism 314 moves the double-function carriage 301, the conveying mechanism 314 does not move the manuscript.

The Tsai reference is similar to the scanners described in the background of the present specification in that these scanners also maintain the document at a stationary position while the reading position traverses the document along with the carriage. Therefore, the Tsai reference is incapable of providing the significant advantages provided by the present invention as a result of the predetermined stationary reading position and conveying the manuscript past this stationary position rather than moving the sensor carriage past a stationary manuscript.

The Arai et al. reference does not remedy the deficiencies of the Tsai reference. Indeed, as explained above the Arai et al. reference is not capable of performing transmission and reflection scanning, let alone scanning of a manuscript. Rather, the Arai et al. reference is directed to scanning a sheet product.

Additionally, Applicant respectfully submits that one of ordinary skill in the art would not have been motivated to modify the floppy disk drive scanner disclosed by the Tsai reference with the sensor 7 of the streak defect detector disclosed by the Arai et al. reference. The Arai et al. reference appears to disclose using the sensor 7 to determine when the sensor camera 3 should start scanning the sheet product (col. 3, lines 21-23). In stark contrast, the Tsai reference determines when to start scanning based upon operation of a selecting device (not shown) (col. 3, lines 21-23). The Tsai reference has no need for any type of sensor to determine whether a manuscript is present or not because the manuscript in the Tsai reference does not move. Therefore, contrary to the allegation of the Examiner, one of ordinary skill in the art would not have been motivated to modify the floppy disk drive scanner disclosed by the Tsai reference with the sensor 7 disclosed by the Arai et al. reference “for the purpose of detecting or sensing the position of the sheet” because the Tsai reference knows the position of the document based upon the fact that the document tray 203 is positioned within the housing.

Additionally, contrary to the purpose set forth in the Arai et al. reference for the sensor 7, the manuscript sensor of the present invention is used to determine the head of the manuscript so that the conveying roll driving means can start conveying the manuscript. In this manner, when the present invention detects the presence of the manuscript, the manuscript is then conveyed past the stationary reading position for scanning. Thus, even if one of ordinary skill in the art would have been motivated to modify the Tsai reference with the sensor 7 disclosed by the Arai et al. reference to detect the position of the sheet any signal representing this position is not used to initiate conveying of a manuscript as recited by the claims. To the contrary, the Arai et al. reference uses this information to initiate scanning, while the Examiner suggests that this

information might be used to save time and energy by stopping the scanning “in case the reader run (sic) out of sheet.”

Lastly, with respect to claims 6, 12 and 18, the Examiner alleges that it would have been obvious to modify the floppy disk drive scanner disclosed by the Tsai reference with the encoder 21 disclosed by the Arai et al. reference because it allegedly would have been obvious to modify the Tsai reference with the sensor 7 disclosed by the Arai et al. reference. Applicant respectfully submits that the Examiner has not provided a prima facie case of obviousness because any motivation for modifying with a sensor is completely irrelevant to whether it would have been obvious to modify with an encoder.

With respect to claim 14, the Examiner does not even attempt to allege that the applied references disclose a manuscript type judging means which judges whether the manuscript is the type which may be read by light transmission or reflection. Applicant submits that the Examiner cannot make this allegation simply because none of the applied references disclose this feature.

III. FORMAL MATTERS AND CONCLUSION

In view of the foregoing amendments and remarks, Applicant respectfully submits that claims 1-6, 8-12, 14-18 and 20-23, all the claims presently pending in the Application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the Application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: 3/18/03



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please cancel claims 7, 13 and 19 without prejudice or disclaimer.

Please amend claim 2 and 8 as follows:

2. (Amended) An image scanner for use in reading image information, comprising:

a driving side conveying roll for conveying a manuscript including said image information to be read past a stationary reading position;

a driven side conveying roll which is located above said driving side conveying roll and which rotates by rolling-contact with said driving said conveying roll;

a manuscript sensor for detecting said manuscript when a head of said manuscript arrives at a position near the rolling-contact position between said driving side conveying roll and said driven side conveying roll;

conveying roll driving means for starting a rotation of said driving side conveying roll when said manuscript sensor has detected an arrival of said head of said manuscript;

light-electricity conversion means for carrying out light-electricity conversion of said image information per one line in a main-scanning direction of said manuscript from a side of one surface of said manuscript at [a] said stationary reading position on a conveying route when said driving said conveying roll is started to rotate by said conveying roll driving means and said manuscript is thereby started to move toward the sub-scanning direction between said driving side and said driven side conveying rolls, said stationary reading position existing downstream of said conveying route from the rolling-contact position by a predetermined distance;

a first light source for emitting light onto said stationary reading position from a side of

another surface of said manuscript opposite to said one surface thereof;

a second light source for emitting light onto said stationary reading position from a side of the same surface of said manuscript as said one surface thereof; and

light source switching control means for selectively rendering either said first light source or said second light source ON to read said image information included in said manuscript, dependent on whether said image information is defined by a reflected light reflected by said manuscript or by a transmitting light transmitting through said manuscript.

8. (Amended) An image scanner for use in reading image information, comprising:

a driving side conveying roll for conveying a manuscript including said image information to be read past a stationary reading position;

a driven side conveying roll which is located above said driving side conveying roll and which rotates by rolling-contact with said driving side conveying roll;

a manuscript sensor for detecting said manuscript when a head of said manuscript arrives at a position near the rolling-contact position between said driving said conveying roll and said driven side conveying roll;

conveying roll driving means for starting a rotation of said driving side conveying roll when said manuscript sensor has detected an arrival of said head of said manuscript;

light-electricity conversion means for carrying out light-electricity conversion of said image information per one line in a main-scanning direction of said manuscript from a side of one surface of said manuscript at [a] said stationary reading position on a conveying route when said driving side conveying roll is started to rotate by said conveying roll driving means and said

manuscript is thereby started to move toward the sub-scanning direction between said driving side and said driven side conveying rolls, said stationary reading position existing downstream of said conveying route from the rolling-contact position by a predetermined distance;

a first light source for emitting light onto said stationary reading position from a side of another surface of said manuscript opposite to said one surface thereof;

a second light source for emitting light onto said stationary reading position from a side of the same surface of said manuscript as said one surface thereof; [and]

light source selection input means for inputting whether either said first light source or said second light source should be selected, dependent on whether said image information is defined by a reflected light reflected by said manuscript or by a transmitting light transmitting through said manuscript, and

light source switching control means for selectively rendering either said first light source or said second light source ON to read said image information included in said manuscript, responsive to a result of selection by said light source selection input means.

Please add new claims 21-23 as follows:

- - 21. (Newly Added) An image scanner, comprising:

- a driving side conveying roll that conveys a manuscript;
- a driven side conveying roll located above said driving side conveying roll;
- a manuscript sensor that detects when said manuscript arrives at a position near the rolling-contact position between said driving side conveying roll and said driven side conveying roll;
- a conveying roll driver that rotates said driving side conveying roll when said manuscript

sensor detects an arrival of said head of said manuscript;

a light-electricity converter that converts light including image information to electricity in a main-scanning direction of said manuscript from a surface of said manuscript when said driving conveying roll rotates to move said manuscript toward a sub-scanning direction between said driving side and said driven side conveying rolls, a reading position being downstream in a conveying route from the rolling-contact position by a predetermined distance;

a first light source that emits light onto another surface of said manuscript;

a second light source that emits light onto said surface of said manuscript;

a light source switching controller that selectively renders either said first light source or said second light source ON to read said image information based on whether said image information is defined by light reflected by said manuscript or by light transmitting through said manuscript; and

an encoder which generates a pulse every time said driven side conveying roll makes a predetermined number of rotations, and wherein said image scanner reads one line of said image information in synchronization with said pulse, said reading of said image information starting when said pulse is generated, said reading of said image information terminating when a predetermined time has passed after said pulse.- -

- - 22. (Newly Added) An image scanner, comprising:

a driving side conveying roll that conveys a manuscript including an image;

a driven side conveying roll which is located above said driving side conveying roll and which rotates with said driving side conveying roll;

a manuscript sensor that detects said manuscript when a head of said manuscript arrives at a position near a rolling-contact position between said driving side conveying roll and said driven side conveying roll;

a conveying roll driver that rotates said driving side conveying roll when said manuscript sensor detects said manuscript;

a light-electricity converter that converts light including image information to electricity in a main-scanning direction of said manuscript from a side of said manuscript when said driving side conveying roll rotates to move said manuscript in the sub-scanning direction between said driving side and said driven side conveying rolls, a reading position being downstream in a conveying route from the rolling-contact position by a predetermined distance;

a first light source that emits light onto another surface of said manuscript;

a second light source that emits light onto said surface of said manuscript;

a light source selection inputter that inputs whether said first light source or said second light source is selected based upon whether said image information is defined by light reflected by said manuscript or by light transmitting through said manuscript;

a light source switching controller that selectively renders either said first light source or said second light source ON to read said image information in response to a result of said input from said light source selection inputter; and

an encoder which generates a pulse every time said driven side conveying roll makes a predetermined number of rotations, and wherein said image scanner reads one line of said image information in synchronization with said pulse, said reading of said image information starting when said pulse is generated, said reading of said image information terminating when a

predetermined time has passed after said pulse.- -

- - 23. (Newly Added) An image scanner, comprising:

a driving side conveying roll that conveys a manuscript including an image;

a driven side conveying roll which is located above said driving side conveying roll and which rotates with said driving side conveying roll;

a manuscript sensor that detects said manuscript when a head of said manuscript arrives at a position near a rolling-contact position between said driving side conveying roll and said driven side conveying roll;

a conveying roll driver that rotates said driving side conveying roll when said manuscript sensor detects said manuscript;

a light-electricity converter that converts light including image information to electricity in a main-scanning direction of said manuscript from a side of said manuscript when said driving side conveying roll rotates to move said manuscript in the sub-scanning direction between said driving side and said driven side conveying rolls, a reading position being downstream in a conveying route from the rolling-contact position by a predetermined distance;

a first light source that emits light onto another surface of said manuscript;

a second light source that emits light onto said surface of said manuscript;

a manuscript type judger which respectively renders said first and said second light sources exclusively ON based on whether said manuscript is read by light transmitting through said manuscript or read by light reflected by said manuscript based upon a comparison of respective signal levels from said light-electricity converter;

a light source switching controller that selectively renders either said first light source or said second light source ON in response to said judgement by said manuscript type judger; and

an encoder which generates a pulse every time said driven side conveying roll makes a predetermined number of rotations, and wherein said image scanner reads one line of said image information in synchronization with said pulse, said reading of said image information starting when said pulse is generated, said reading of said image information terminating when a predetermined time has passed after said pulse.- -